

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 October 2001 (11.10.2001)

PCT

(10) International Publication Number
WO 01/74257 A1

(51) International Patent Classification⁷: **A61B 17/32**,
B26B 29/02

(74) Agent: **LUCKHURST, Anthony, Henry, William**;
Marks & Clerk, 57-60 Lincoln's Inn Fields, London
WC2A 3LS (GB).

(21) International Application Number: **PCT/GB01/01561**

(22) International Filing Date: **5 April 2001 (05.04.2001)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
0008409.5 **5 April 2000 (05.04.2000) GB**

(71) Applicant (for all designated States except US):
MAERSK MEDICAL LIMITED [GB/GB]; Thorn-
hill Road, North Moons Moat, Redditch, Worcestershire
B98 9NL (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(72) Inventor: **WILSON, Gordon** (deceased).

Published:

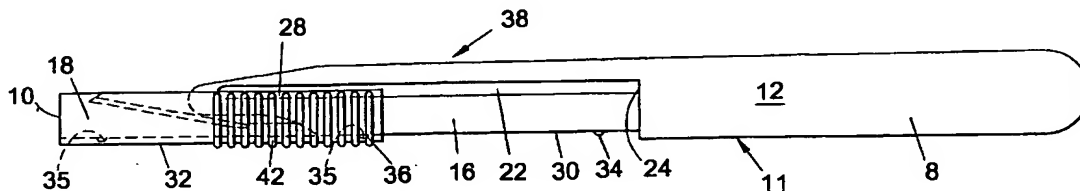
— with international search report

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BALL, Nigel**
[GB/GB]; 33 Town End Road, Ecclesfield, Sheffield S35
9UX (GB).

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **SURGICAL SCALPEL WITH RETRACTABLE BLADE GUARD**



(57) Abstract: A surgical scalpel (2) has a sliding cover (10) which fits within the overall contour of the body and slides between an extended position covering a blade (4) and a retracted position exposing the blade (4) for use. An upper surface (38) of the body is left clear. The cover (10) has nibs (28) which slide in grooves (22) in the handle to hold the cover in extended and retracted positions. Pips (34) on the handle engage in recesses (35) in the cover to hold the cover in extended and retracted positions.

WO 01/74257 A1

SURGICAL SCALPEL WITH RETRACTABLE BLADE GUARD

The present invention relates to a scalpel, and is particularly concerned with disposable scalpels, and scalpels having a sleeve or the like which covers the blade when the scalpel is not in use.

Disposable surgical scalpels typically comprise an elongate, plastics handle having a metal blade secured to one end of the handle. The blade will generally have a foot portion with one or more slots which fit over nibs or ribs on the side of the handle. The blade may be secured by a cover which is welded in place to sandwich the foot of the blade between the end of the handle and the cover. Such constructions are well known in the art. The blade may also be insert moulded in position at the end of the handle.

Disposable scalpels are desirable because they avoid the need for sterilisation, other than at the point of packaging by the manufacturer. However, to be economically viable, the scalpel must be low cost, and yet offer the surgeon the feel or comfort of a more expensive re-usable scalpel.

In recent years, considerable attention has been focussed on providing scalpels, hypodermic syringes, and the like in which the user in particular is protected from accidental cuts or "sticks". With scalpels, attention has been focussed on providing blade guards which can be readily operated by the surgeon before passing the used scalpel to the theatre nurse. While appreciating the need for such safety, the surgeon requires a safety device which will not hinder the surgeon's work and which will not significantly change the feel of the scalpel. The hospital requires continued low cost.

One aim of the invention is to provide a scalpel having a retractable blade cover, which can easily and safely be operated by the surgeon or nurse.

Another aim of the present invention is to provide an improved handle design for a scalpel, which will enhance the feel and control of the surgeon.

There are numerous patents describing scalpels incorporating blade covers. Many are too expensive for use in disposable scalpels, requiring a blade holder which retracts within the handle, for example, which provides for complex moulding and assembly operations.

EP-A-583 992 shows a simple blade cover, but this remains in place around the blade, obscuring the surgeons view and making access to small areas difficult.

US-A-5 309 641 illustrates a commercial design in which a cover slides along the handle body. However, the positioning of the cover over the upper surface of the handle body means that the cover must be locked very securely when in its open position, to prevent slippage when the surgeon applies force with the forefinger.

EP-A-555 196 shows a scalpel design in which a generally U-shaped cross-section blade cover is positioned around the underside of the handle body. However, the design perceives a locking detent mechanism, which is released by a pin positioned on the upper surface of the scalpel. A pin extending laterally through the handle body engages in slots in the guard, to limit the extent of sliding of the guard. While this design incorporates

desirable features, it is not suited to the requirements of simplicity, and hence low cost, in a disposable scalpel.

Accordingly, one aspect of the present invention provides a scalpel having an elongate handle, a blade mounted on the handle and a blade cover, the cover being slidable on the handle between a retracted position exposing the blade for use, and an extended position covering the blade, wherein grooves are provided on side surfaces of the handle and/or on inner surfaces of the cover, and complementary nibs are provided on the other member, whereby the nibs and grooves co-operate to hold the cover on the handle and allow sliding movement.

Another aspect of the invention provides a scalpel having an elongate handle having first and second side surfaces, the first and second side surfaces of the handle having longitudinally extending retaining grooves therein, a blade at the end of the handle, and a blade cover which is slidable between a retracted position exposing the blade for use and an extended position covering the blade, characterised in that the blade cover has first and second side walls joined at a lower edges thereof, and inwardly extending nibs at the upper edges thereof, the grooves are closed at each end, the nibs fit in the retaining grooves to retain the cover on the handle and the sliding movement of the cover is guided by the movement of the nibs in the grooves.

Preferably the cover is of resilient plastics material, and moulded so that the resilience retains the nibs in the grooves.

Very preferably means is provided for holding the cover in three positions: an extended position in which the cover covers the blade prior to use; a retracted position in which the cover is retracted, exposing the blade ready for use, and a locked position in which the cover again covers the blade

and is locked against movement to the retracted position. After use of the scalpel, the cover can be moved from the retracted position, through the extended position and into the locked position.

The blade cover may be snapped into position on the handle. However, this imposes constraints on the materials to be used as the cover must be sufficiently resilient to allow the nibs to ride over the body of the handle before engaging in the grooves.

Preferably, mounting grooves are provided on the handle, the mounting grooves being open at one end, and the nibs on the handle being slidable longitudinally into the open end of the grooves.

Preferably the mounting grooves extend alongside the retaining grooves and a transfer path is provided for the nibs to transfer from the mounting grooves to the retaining grooves.

Preferably the transfer grooves are positioned to guide the cover into the extended position as the cover is mounted on the handle.

Preferably, the scalpel cross-section, at least in the region of the cover, tapers in the downward direction away from an upper surface of the handle.

Another aspect of the invention provides a scalpel having an elongate handle and a blade mounted on the handle, wherein the handle has an upper surface on which a finger of a user can bear in use, and a pair of opposed side surfaces which depend down from the upper surface and are sloped towards each other.

Heretofore, scalpel handles have almost universally been of rectangular or oblong cross-section and on occasion of circular cross-section. By studying the use of the scalpel, we have determined that a cross-section which tapers or narrows towards the underside of the handle provides a more comfortable feel for the user. Such a cross-section can also enhance the user's grip, because it prevents the handle slipping down between the thumb and middle finger when pressure is applied on the upper surface by the user's forefinger. An additional advantage of the tapered cross-section is that the chances of picking up the scalpel the wrong way round, with the sharpened blade on the upper edge, are significantly reduced. This has been a problem with scalpels in the past, as most scalpels generally have a symmetrical handle cross-section. Whilst the design of this invention is particularly suited to disposable scalpels with plastics handles, it is also usable with other scalpel types.

The invention will be further described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a side view of a disposable surgical scalpel forming a first embodiment of the invention, with a blade cover removed;

Figure 2 is a side view of the scalpel of Figure 1, with the blade cover in place and shown in a retracted position exposing the blade for use;

Figure 3 is a side view corresponding to Figure 2, with the cover in an extended position, covering the blade;

Figure 4 is a cross-sectional view on line IV-IV of Figure 2;

Figure 5 is a cross-section on line V-V of Figure 2;

Figure 6 is a side view of a handle of a disposable surgical scalpel forming a second embodiment of the invention;

Figure 7 is an enlarged cross-section on line VII-VII of Figure 6;

Figure 8 is an enlarged cross-section on line VIII-VIII of Figure 6;

Figure 9 is a cross-section on line IX-IX of Figure 6;

Figure 10 is a plan view from above of the scalpel body of Figure 6;

Figure 11 is a cross-section along line XI-XI of Figure 6;

Figure 12 is a side view of a cover forming part of the embodiment of Figure 6;

Figure 13 is a plan view of the cover of Figure 12;

Figure 14 is a cross-section on line XIV-XIV of Figure 13;

Figure 15 is an enlarged cross-section on line XV-XV of Figure 13;

Figure 16 is an enlarged cross-section on line XVI-XVI of Figure 13;

Figure 17 is an enlarged end view on arrow A of Figure 12;

Figure 18 is a partial cross-section on line XVIII-XVIII of Figure 12, showing a ribbed wall;

Figure 19 is a side view showing the cover of Figure 12 about to be slid onto the handle of Figure 6 in an assembling operation;

Figure 20 shows the cover partially slid onto the handle;

Figure 21 is a side view of the assembled scalpel parts of Figure 6 and 12, with the cover in an extended position;

Figure 22 is a side view of the assembled scalpel parts of Figures 6 and 12 with the cover in a retracted position.

Figure 23 is a side view of the assembled scalpel parts of Figures 6 and 12 with the cover in the locked position.

Referring to Figure 1, a disposable surgical scalpel 2 has a blade 4 insert moulded into the end 6 of a plastics handle body 8, as is well known in the art.

The handle body 8, when assembled with a blade cover 10 (Figure 2) forms a handle 11 having a generally triangular cross-section as seen in Figures 4 and 5.

Side surfaces 12, 14 of the handle body 8 have recesses 16 for receiving side walls 18, 20 of the cover 10, so that the scalpel handle 11 has a generally smooth contour along its length.

Longitudinally extending grooves 22 extend along the recesses 16 and are closed at their front and rear ends 24, 26. The cover 10 has an inwardly extending nib 28 at the upper edge of each side wall 18, 20. Nib 28 extends for half the length of the cover 10, at the rear portion thereof. Nib 28 could be a plurality of short nibs, rather than the single long nib as shown.

As seen in Figures 2 and 3, as the cover is slid between the retracted and extended positions, the nib 28 abuts groove end 24 or groove end 26 to limit travel of the cover 10.

The cover 10 is moulded of resilient, transparent, plastics material. The dimensions and material are chosen to ensure a snug fit around the handle, while allowing the cover to be easily slid along the handle body. In use, the cover 10 will be gripped by the thumb and middle finger of the user, and so any looseness is undesirable.

To hold the cover in the extended or retracted position a detent-type mechanism is provided. A pip 34, 36 on the handle 8 engages in a hollow in the cover 10, or vice-versa, at each extremity of movement. Again, the resilience of the cover 10 can provide an adequate engaging force to prevent inadvertent disengagement between the pip and hollow, but allowing the user to move the cover on the handle.

It is particularly preferred if the means for holding the cover 10 in the extended or retracted position is formed at the bottom surfaces 30, 32 of the handle body 8 and cover. As shown, pips 34, 36 are exaggerated for clarity, but are formed on the bottom surface 30 of the handle body 8 and these will engage in recesses or hollows 35 provided on the inside of the bottom wall 32 of the cover 10. In the retracted position, the cover is held by both pips 34, 36 engaging in respective hollows 35 for greater security against slippage.

Referring to Figures 4 and 5, a unique feature is provided by the cross-section of the scalpel. Along the length of the scalpel 2, but particularly in the forward region which is gripped by the user, at the location of the cover 10, the combined handle 11 and cover 10 forming the scalpel 2 has a triangular cross-section.

An upper surface 38 of the handle 11 is generally flat. Side surfaces 12, 14 of the handle body 8 and side walls 18, 20 of the cover 10 slope inwardly to provide a taper. Bottom wall 32 joins the side walls 18, 20 and is preferably arcuate.

The upper surface 38 of the scalpel 2 is left clear, providing a secure surface for the user to press on, while the tapering cross-section provides a comfortable and secure grip for the user.

Ribs 42 are provided on the cover 10 to assist the user in sliding the cover, and may also provide increased grip when cutting.

Various modifications will be apparent to those skilled in the art. For example, the pips 34, 36 and hollows 35 could be provided on the side surfaces 16 of the handle and side walls 18, 20 of the cover 10 where there will be greater flexibility from the cover shape. Also, the cover could be slidably attached to the handle body by providing nibs on the handle body which slide in grooves in the cover walls.

A second embodiment of the invention will be described with reference to Figures 6 to 23. Figures 6 to 11 show the scalpel body or handle 50, Figures 12 to 18 show the cover 52, and Figures 19 to 23 show the cover 52 as it is slid on to the handle 50 and then moved between the extended, retracted and locked positions.

Referring firstly to Figures 6 to 11 a scalpel handle 50 is moulded from plastics material, such as high impact polystyrene. A rear end 54 of the handle 50 has a generally tapered profile as seen in the plan view of Figure 10 and the cross-section of Figure 11, with recesses 56 which may carry a brand name or logo. A number, in this case 11, is provided on the

end of the handle to indicate the shape of the blade carried by the handle 50. The number may be moulded into the handle using a replaceable mould insert.

Referring to Figure 11, the front end 58 of the handle 50 is shown as having a slot 60. The handle 50 is actually insert moulded around a blade 140, which is shown in Figures 19 to 23, and so slot 60 indicates the general location of the foot of the blade which is held in the handle 50.

An upper surface 62 of the handle has ribs 64 to facilitate the grip of the handle by the user.

As can be seen in Figure 8, the central body portion 66 of the handle 50 is generally T-shaped, with a laterally extending cross wall 67, forming the bar of the T, and a downwardly extending central web or wall 68. Wall 68 has a rounded, lower edge 70. A laterally extending end wall 72 is formed where the central wall 68 joins the rear end 54 of the handle.

At the junction between wall 68 and the cross wall 67, a retaining groove 74 is formed. Retaining groove 74 is closed at a rear end 74a by wall 72, and at a front end 74b by a wall 76 (see Figures 6 and 7).

Below retaining groove 74, a parallel mounting groove 78 is provided. Mounting groove 78 is open at the front end 58 of the handle 50, and extends to about half way along the retaining groove 74, where it is closed by an end wall 80 (shown in the enlarged detail in Figure 11). The open end 78a of groove 78 is flared and the front end 58 of the handle has a tapering thickness to facilitate insertion into the cover 52, as will be described hereinafter.

Where they run alongside each other, grooves 74,78 are separated by a rib 82. Rib 82 is interrupted along its length to form two transfer paths 84a, 84b.

As seen in Figures 7 and 8, mounting groove 78 has a triangular, cross-section, the bottom wall of wall 78c the groove sloping down from the surface 86 of wall 68 towards the rib 84. The slope of the bottom wall 78c continues on in the mounting groove 74, so that bottom wall 74c of groove 74 slopes downwardly away from rib 82, and 'levels out' at region 74d, just before wall 67.

A wedge-shaped stop 90 is provided on the lower edge 70 of wall 68. Stop 90 has a sloping wall 90a forming a ramp extending away from the rear end 54 of the handle 50, and a vertical wall 90b extending perpendicularly from the lower edge 70 and facing towards the front end 58 of the handle 50. A through aperture 92 is formed in the wall 68 adjacent the stop 90, so that the stop is supported on a web 94. In use, the web 94 can flex slightly, as will be described more fully hereinafter.

Figure 6 illustrates one side of the scalpel handle 50, the other side is formed as a minor image.

The cover 52 will now be described with reference to Figures 12 to 18. The cover is moulded from resilient, translucent plastics material such as Styrolux 684D (a styrene-butadiene copolymer) or K Resin and has a pair of parallel side walls 100 having ribs 102 (Figure 18) formed on their outer surfaces. Walls 100 are joined at their lower edge 103 by webs 104,106 to form a generally U-shape cross-section. As will be described more fully hereinafter, webs 104,106 incorporate formations which engage with the stop 90 on handle 50 to hold the cover 52 in position along the handle 50.

The upper edges 112 of walls 100 are able to flex outwardly when the cover 52 is being mounted on the handle 52.

Inwardly directed flanges or nibs 110 are formed on the upper edges 112 of the walls 100, and extend along the inner surfaces 100a of the walls 100, between the front and rear ends 103,105 of the cover 52. As seen in Figures 13, 15 and 16, at their widest point the nibs 110, have extensions 111a,111b with facing surfaces 112, which mirror the bottom wall 74c, 74d of retaining groove 74. Thus surface 112 has a sloping portion 112a, and a vertical portion 112b. A recess 114 is formed between the extensions 111a, 111b. Recesses 114 have facing vertical walls 114a, as seen in Figure 16.

The rearmost nib portions 111b are chamfered in plan view, to provide tapered mouth 116 which receives the tapered front end 58 of the scalpel body 50, at the mouth 78a of the mounting groove, as will be described hereinafter.

Referring to the webs 104,106 the forward web 104 has a first wedge shaped retaining formation 120 formed on its upper or inner surface 104a, with a sloping face 120a sloping upwards from the rearward direction of the cover 50, and a rounded nose 120b at the forward end. Formation 120 cooperates with stop 90 to hold the cover 52 in the retracted position on the handle 50.

The rearward web 106 has a second wedge shape retaining formation 130 formed on its upper surface 106a. Wedge shape 130 has a vertical rear wall 130a which cooperates with wall 90b to lock the cover 50 in its forwardmost locked position. Wedge 130 has a sloping upper surface 130b, sloping downwardly in the forward direction from rear wall 130a, to a channel 130c formed at its lower end, and bound by a rounded nose

130d. The stop 90 sits on the sloping surface 130b, and abuts the rounded nose 130d when the cover 52 is held in its extended position, prior to use.

The mounting of the cover 52 on the handle 50, and the sliding operation of the cover 52 will now be described with reference to Figures 19 to 23.

In Figure 19, the handle 50 is shown with a blade 140 which has been insert moulded into the handle 50, occupying slot 60 of Figure 11. As known in the art and described above, the blade could be clipped to a formation on the handle, and held in place by a plastic cover welded to the handle. This invention is particularly suited to disposable scalpels, but blade 140 could be replaceably mounted on the end of the handle which would preferably be of metal to enable prolonged use.

Cover 52 is shown aligned with the handle 50, ready for the nibs 110 to be slid either side of the blade 40 and into the flared opening 78a of mounting groove 78. As mentioned above, the tapered mouth 116 facilitates entry of the scalpel handle front end 58a.

In Figure 20, the cover 52 has been slid part way into the mounting groove 78a. The rib extensions 111a, 111b ride in the groove 78a. The thickness of the wall 68 between the grooves 78 (see Figure 8) means that the cover walls 100 flex apart. Since the walls 100 are joined only at their lower edges, by webs 104, 106, they can be allowed to flex, by appropriate choice of the plastics material for cover 52.

In Figure 21, the cover 52 has been slid onto the handle 50 until the nib extensions 111a, 111b are aligned with the transfer paths 84a, 84b. The rear rib extension 111b can be wider than forward path 84a, so that extension 111b will ride past the path 84a. In practice, the cover is

mounted on the handle by an assembling machine, and so movement of the cover can be controlled.

When the nib extensions 111a, 111b are aligned with the paths 84a, 84b the cover will spring upwards, due to the resilience of the sidewalls 100, and the cooperation between the sloping surface portions 112a of the nib extensions 111a, 111b and the sloping bottom walls 78c, 74c of the grooves 78, 74. It can be seen that the nibs 110 must also pass over the central rib portion 82b and recess 114 is deep enough to provide for this. Once the nibs 110 have sprung fully into the retaining groove, the full length of the nibs 110 sits between the upper wall 67 and the rib 82 so that the cover 52 is not removable, or not easily removable, from the handle 50.

As shown in Figure 21, the transfer paths are located so that the cover snaps into its extended position, with the cover 52 covering the blade 140.

In this extended position, the locking wedge 90 on the handle 52 engages with the wedge shaped formation 130 on web 106 of the cover 50. The sloping surface 90a, 130b of the wedges rest on each other, and the nose 90c of wedge 90 sits in channel 130c. The cover 52 is thus held against sliding movement along the handle 50. In this position, the assembled scalpel is packaged, sterilised and shipped to consumers.

Figure 22 shows the scalpel with the cover 52 in its retracted position ready for use. To move the cover 52 to the retracted position, the cover 52 is slid backwards along the handle 50. As a sliding force is applied to the cover, by gripping the cover walls 100 at ribs 102, the nose 90c of locking wedge 90 rides over the nose 130d of the first retaining wedge 130.

To enable this, the web 94 flexes. The core is held on the handle by nibs 110 being firmly held in the retaining groove 74. The nose 90c of locking

wedge 90 rides up the sloping surface 120a of the second retaining wedge 120, and over the end of the wedge shape 120. At this point, the cover 52 has been slid fully rearward to abut end walls 72, and so is held firmly in position by the nibs 110 in retaining grooves 74, locking wedge 90 bearing on the second retaining wedge 120, and the abutment against wall 120.

During use, the scalpel will typically be held by being gripped in the region of the ribs 102 of cover 52, with a finger placed on ribs 64 of the upper surface 62. However the manner of holding a scalpel does vary from user to user, and may also depend on the cutting operation being performed.

After use, the cover 52 is slid forwards to the locked position, Figure 23. The sloping surface 90a of locking wedge 90 rides over the nose 120c of second retaining wedge 120. The cover 52 is then slid forwards easily until the sloping surface 90a rides onto the nose 130d of the first retaining wedge 130. The user will apply more force at this point, causing the wedge 90 to slide fully over the nose 130d and also over the complete length of the sloping surface 130b, until wedge shape 90 is felt to snap down and the nibs 110 abut wall 76 at the end of the retaining grooves 74. In this position, the cover cannot be slid backwards because the wall 90b abuts wall 130a, and so the cover is locked in position and the scalpel cannot be re-used.

Since the scalpel is primarily intended to be disposable, it is largely for single use. Hence, some deformation of the co-operating formations 90, 120, 130 may be allowed to take place as they ride over each other.

Further forward movement of the cover 52 is prevented by nibs 110 engaging the end wall 76 of retaining groove 74.

It will be appreciated that when we refer to relative orientations, such as upper or lower, above or below, vertical or horizontal, this is to facilitate description of the embodiment with reference to orientation of the scalpel in the drawings. In use, a scalpel will adopt many orientations.

The invention provides a disposable scalpel which is easily manufactured and assembled at low cost, and in which the cover can be locked in place after use.

CLAIMS:

1. A scalpel having an elongate handle, a blade mounted on the handle, and a blade cover, the blade cover being slidable between a retracted position exposing the blade for use, and an extended position covering the blade, wherein retaining grooves are provided on side surfaces of the handle body and/or on inner surfaces of the cover, and nibs are provided on the other member, whereby the nibs and grooves co-operate to hold the cover on the handle body and allow sliding movement.
2. A scalpel as claimed in claim 1, wherein holding means is provided for holding the cover in the extended and retracted positions.
3. A scalpel as claimed in claim 2, wherein the holding means comprises co-operating formations on said handle and said cover, said formations being shaped to co-operate to hold said cover temporarily in said retracted position and substantially permanently in said locked position.
4. A scalpel as claimed in claim 2 or 3, wherein the holding means holds the cover in three positions: an extended position in which the cover covers the blade prior to use; a retracted position in which the cover is retracted, exposing the blade ready for use, and a locked position in which the cover again covers the blade and is locked against movement to the retracted position.
5. A scalpel as claimed in any one of claims 1 to 4, wherein the cover has first and second ends and is of substantially U-shaped cross-section throughout its length between the ends, the nibs and/or grooves on the cover being positioned between ends of the cover.

6. A scalpel as claimed in any one of claims 1 to 5, wherein the side surfaces of the handle are recessed, the cover slides in the recess, and in the retracted position the cover forms a substantially smooth profile with the handle.

7. A scalpel as claimed in any one of claims 1 to 6, wherein mounting grooves are provided, the mounting grooves being open at one end and laying alongside the retaining grooves, and a path is provided for guiding a nib, inserted through the open end of the mounting groove, from the mounting groove into the retaining groove.

8. A scalpel as claimed in any one of claims 1 to 7, wherein the retaining grooves are closed at their ends.

9. A disposable scalpel having an elongate handle having first and second side surfaces, the first and second side surfaces of the handle having longitudinally extending retaining grooves therein, a blade at a front end of the handle, and a blade cover which is mounted on the handle and slidable between a retracted position exposing the blade for use and an extended position covering the blade, characterised in that the blade cover has first and second side walls joined at a lower edges thereof, and inwardly extending nibs at the upper edges thereof, the grooves are closed at each end, the nibs fit in the retaining grooves to retain the cover on the handle and the sliding movement of the cover is guided by the movement of the nibs in the grooves.

10. A scalpel as claimed in claim 9, wherein the side walls of the cover are joined by a web which extends under a lower surface of the handle, a first wedge shaped formation is provided on the web, a co-operating second wedge shaped formation is provided on the lower surface of the

handle, facing the web, and the wedge shaped formations co-operate to hold the cover against sliding movement along the handle.

11. A scalpel as claimed in claim 10, wherein the wedge shaped formation on the handle slides onto the wedge shaped formation on the web to hold the cover in the extended position, and slides past the wedge shaped formation on the web to hold the cover in the locked position.

12. A scalpel as claimed in claim 10 or 11, wherein a third wedge shaped formation is provided on the cover or on the handle to co-operate with the wedge shaped formation on the handle or the cover, to hold the cover in the retracted position.

13. A scalpel having an elongate handle and a blade mounted on the handle, wherein the handle has an upper surface on which a finger of a user can bear in use, and side surfaces which depend down from the upper surface and are sloped towards each other.

14. A scalpel as claimed in claim 13, in which the upper surface is substantially flat at a region gripped by the user.

15. A scalpel as claimed in claim 13 or 14, wherein the handle includes a handle body and having a blade cover which is slidable along the handle body between a retracted position exposing the blade for use and an extended position covering the blade, wherein the outer surfaces of the cover are substantially co-planar with outer surfaces of the handle body to provide a smoothly contoured handle when the cover is in the retracted position.

16. A scalpel as claimed in claim 13, 14 or 15, wherein the cover comprises a pair of side walls joined at a lower end thereof, and the cover extends under a lower edge of the handle body.

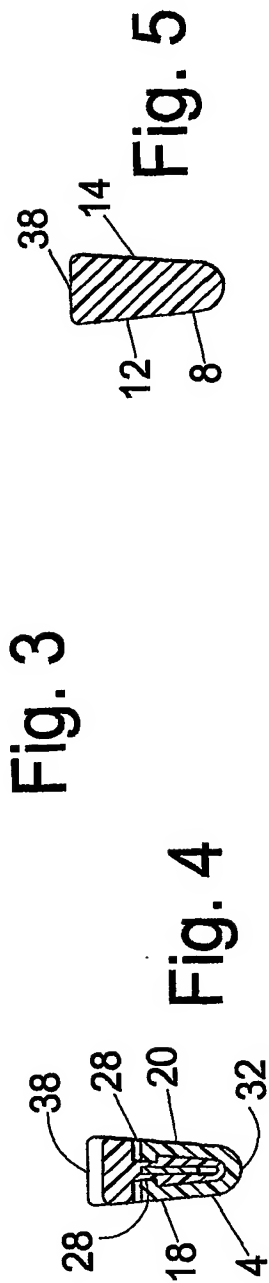
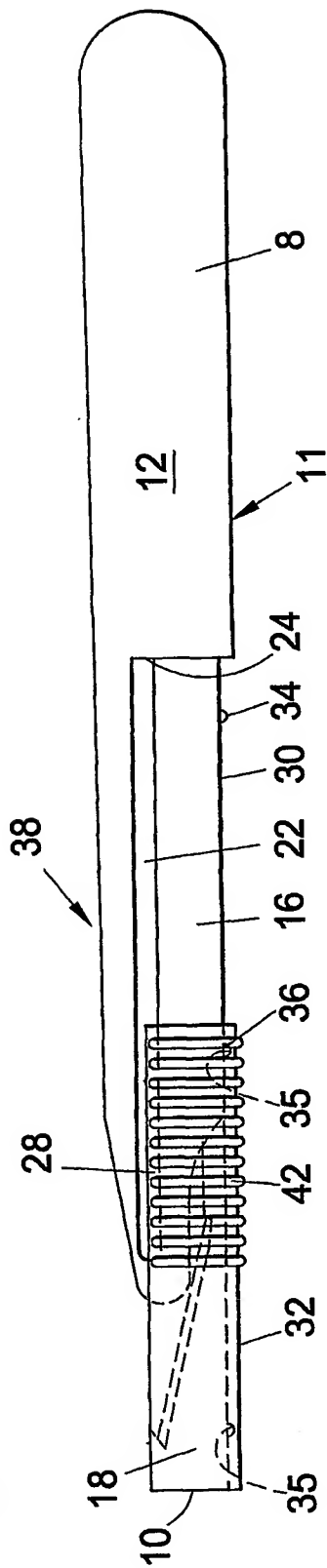
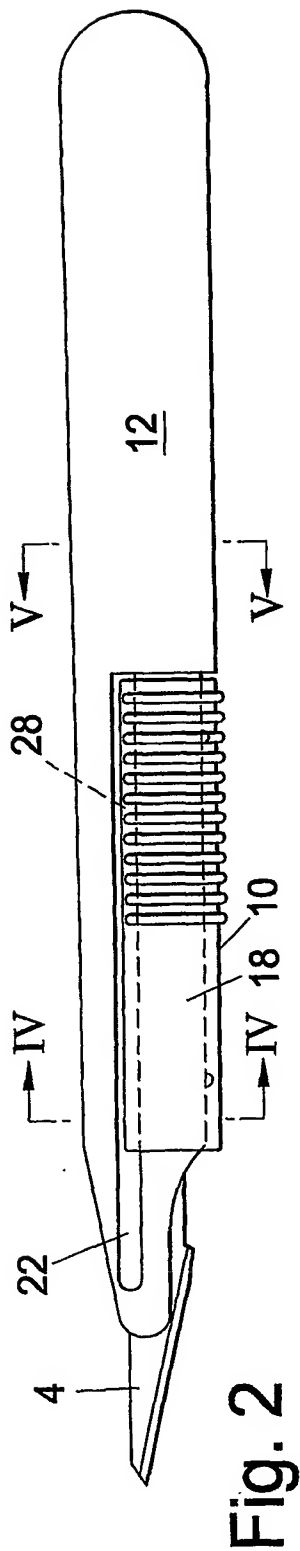
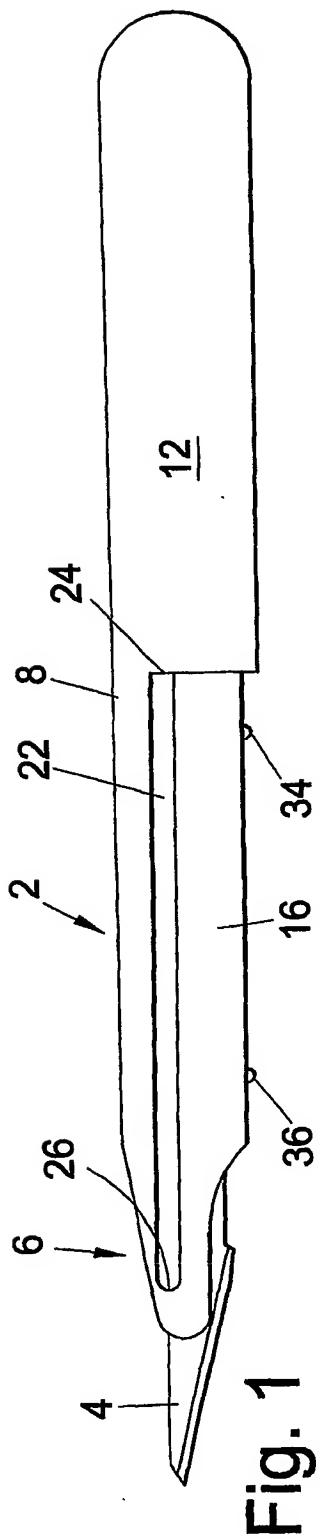
17. A scalpel as claimed in claim 16, wherein the cover is mounted on the handle body by means of ribs in one member which slide along grooves in the other member.

18. A disposable scalpel having a plastics handle with a blade mounted at one end of the handle, and a cover slidably mounted on the handle for movement between a safety position in which the cover covers the blade and a retracted position in which the blade is exposed for use, the cover having a U shaped cross-section and extending under an underside of the handle, wherein the co-operating formations are integrally moulded on the handle and the cover to hold the cover in the safety and the retracted positions.

19. A scalpel as claimed in claim 18, wherein the co-operating formations are provided on the underside of the handle and a facing inner surface of the cover.

20. A scalpel as claimed in any one of claims 9 to 12, wherein the cover is formed of resilient plastics material, and the side walls of the cover are biased towards the handle at their upper edges.

1/6



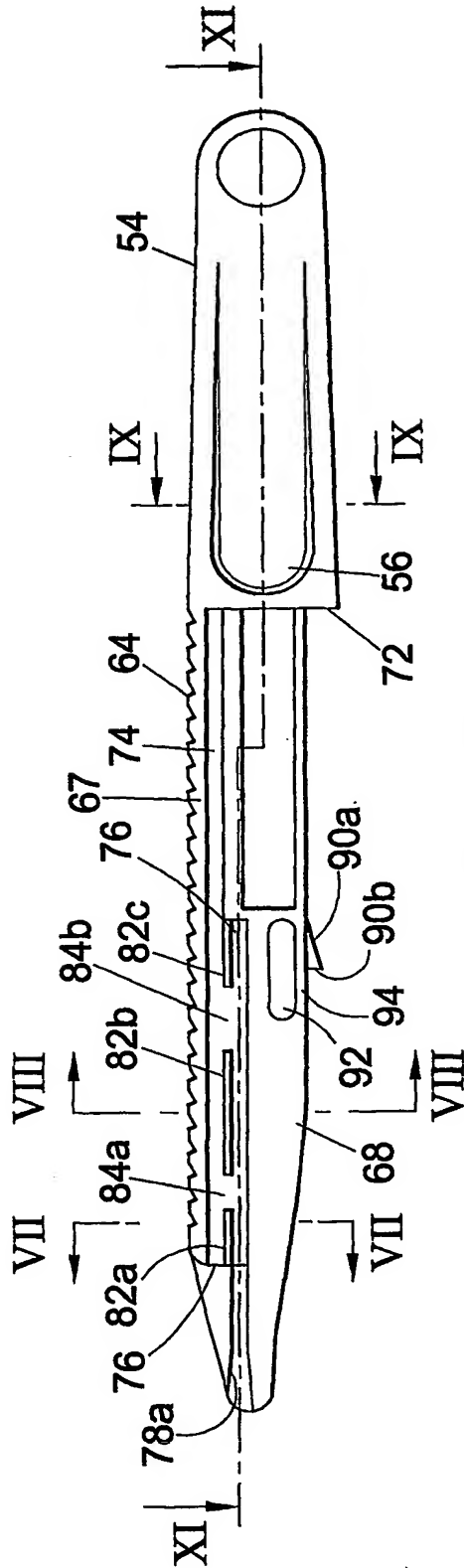


Fig. 6

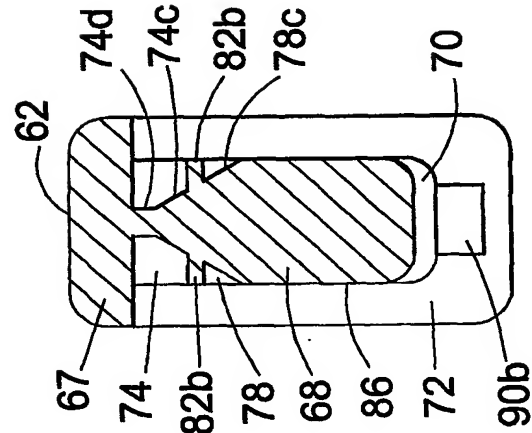


Fig. 8

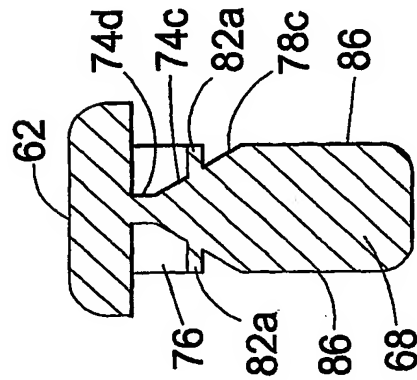


Fig. 7

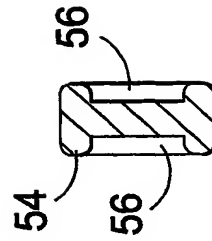
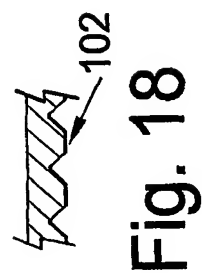
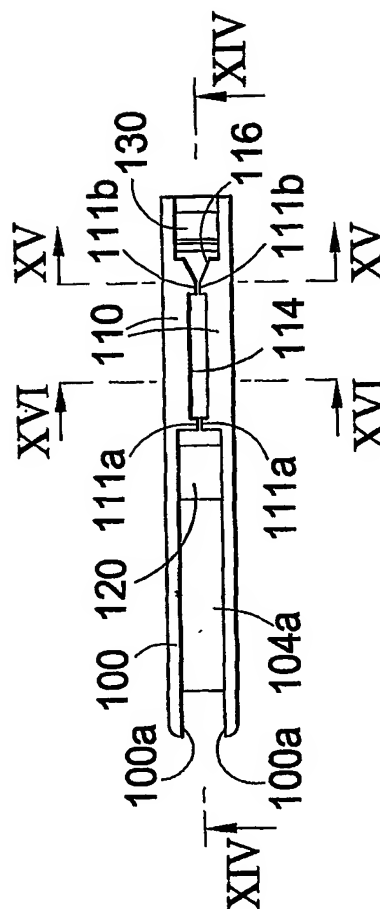
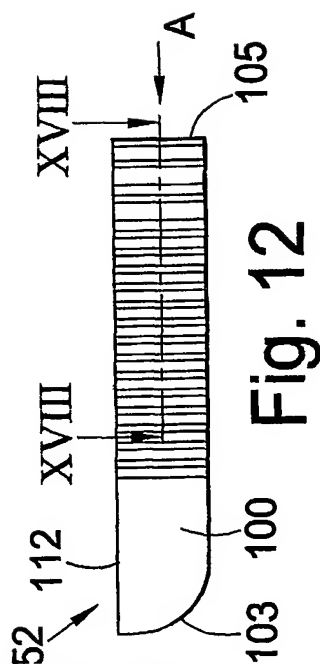
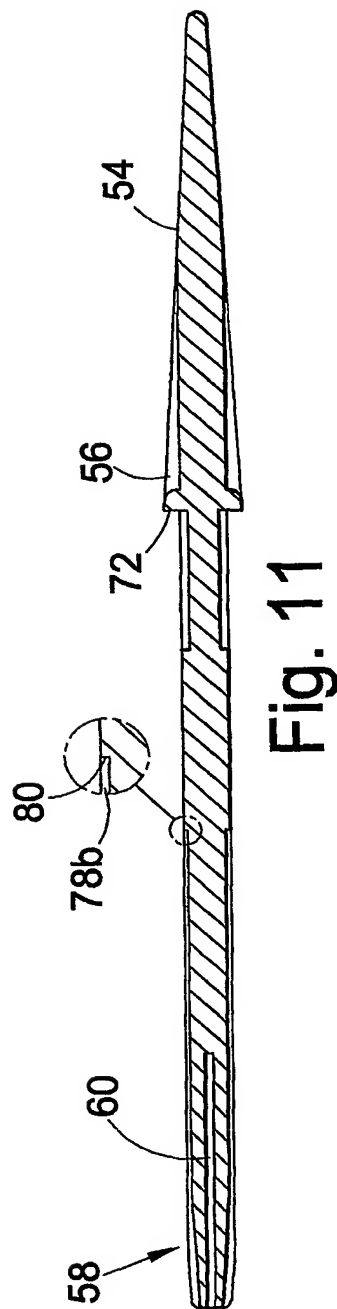
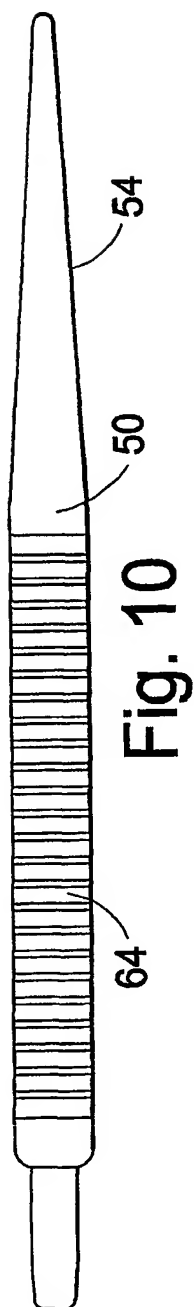


Fig. 9



4/6

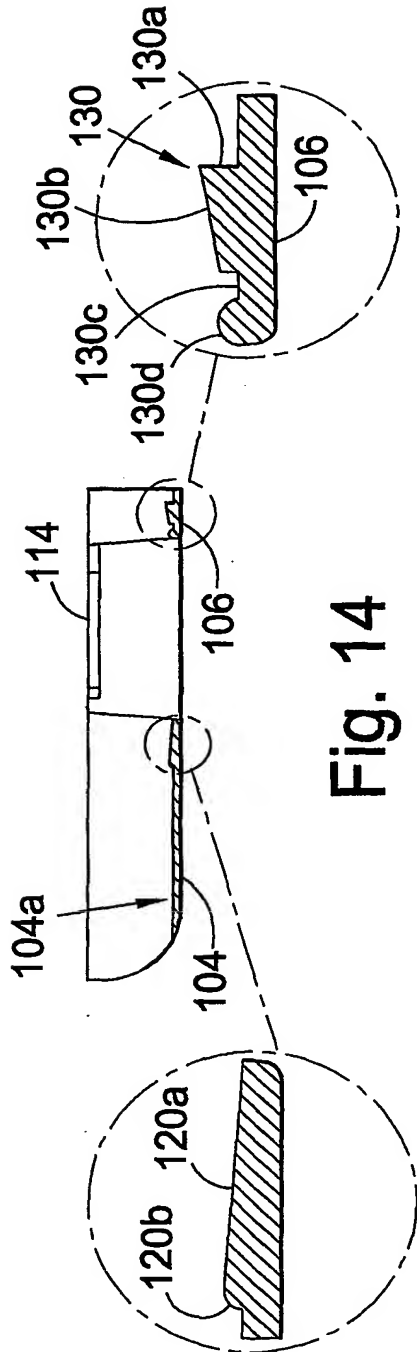


Fig. 14

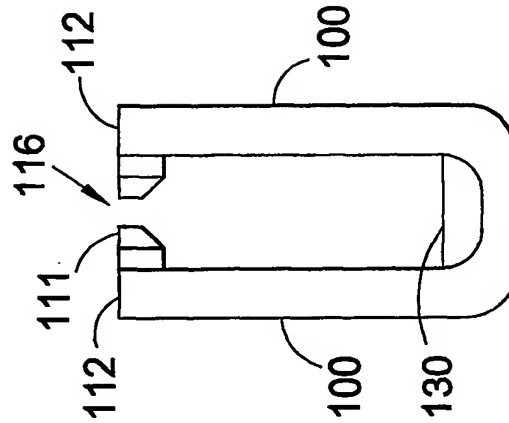


Fig. 17

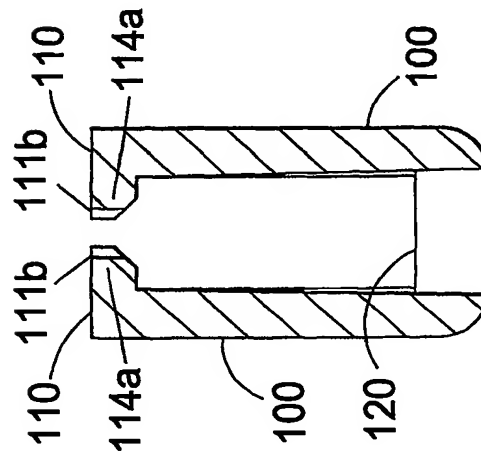


Fig. 16

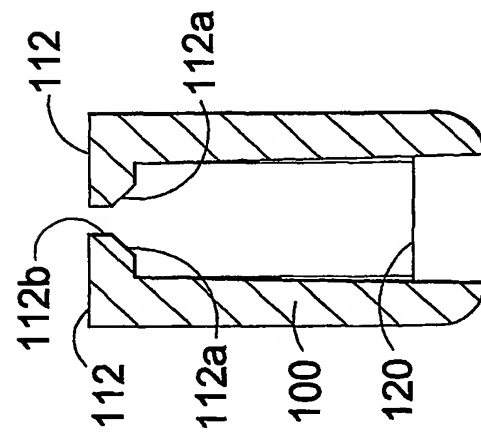


Fig. 15

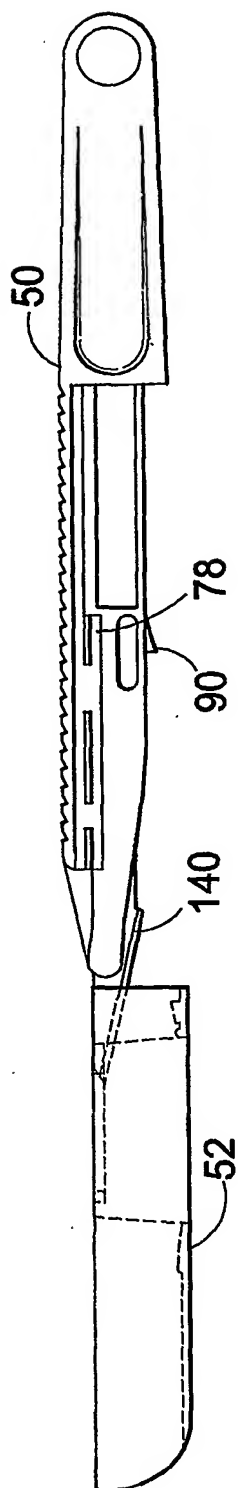


Fig. 19

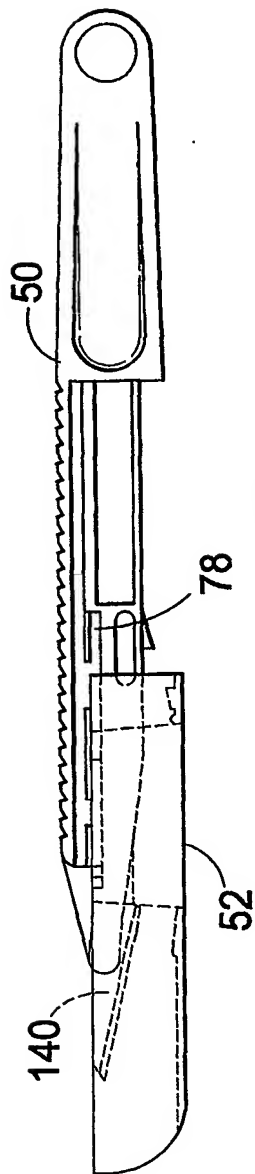


Fig. 20

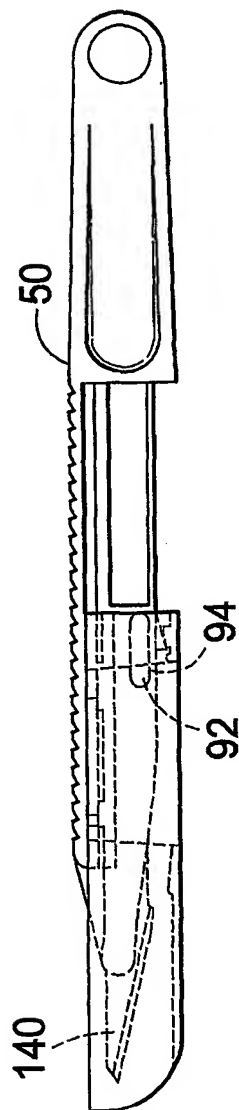


Fig. 21

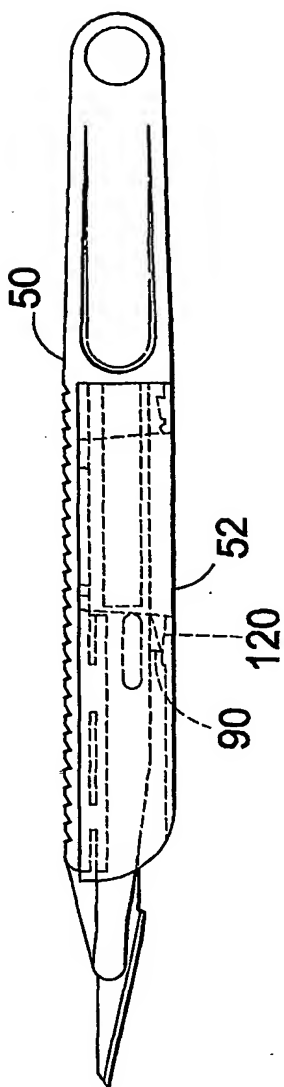


Fig. 22

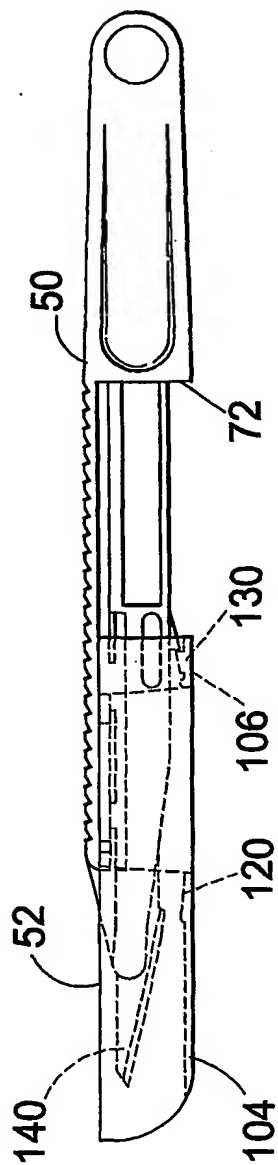


Fig. 23

INTERNATIONAL SEARCH REPORT

National Application No
PCT/GB 01/01561

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B17/32 B26B29/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B B26B B25G A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 988 832 A (BECTON DICKINSON CO) 29 March 2000 (2000-03-29) abstract; figure 5	1-12, 18-20
Y	US 5 536 257 A (SISSON PENELOPE R ET AL) 16 July 1996 (1996-07-16) abstract; figures 1,2	1-12, 18-20
X	DE 21 08 466 A (NOLD, DEMMING & CO.) 7 September 1972 (1972-09-07)	13,14
A	the whole document	1,9,18
X	US 4 657 012 A (BURGIN KERMIT H) 14 April 1987 (1987-04-14)	13,14
A	the whole document	1,9,18
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

19 June 2001

Date of mailing of the international search report

27/06/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hansen, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 01/01561

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 791 055 A (MANGOL PETRA) 11 August 1998 (1998-08-11)	13,14
A	abstract; figures 2,3	1,9,18
A	US 5 279 581 A (FIRTH JOHN R ET AL) 18 January 1994 (1994-01-18)	1-20
A	abstract; figures 1,3	
A	WO 97 35525 A (SHACKELFORD HOWARD L SR ;SHACKELFORD HOWARD L JR (US)) 2 October 1997 (1997-10-02)	1-20
A	abstract; figures 1,4	
A	EP 0 396 938 A (AMF MARES SPA) 14 November 1990 (1990-11-14)	1-20
	abstract; figures 1,2	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/01561

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0988832	A	29-03-2000	US 5938676 A JP 3016559 B JP 11318913 A US 6053929 A	17-08-1999 06-03-2000 24-11-1999 25-04-2000
US 5536257	A	16-07-1996	US 5601535 A US 4826490 A US RE36447 E US RE36398 E US 5549572 A	11-02-1997 02-05-1989 14-12-1999 16-11-1999 27-08-1996
DE 2108466	A	07-09-1972	NONE	
US 4657012	A	14-04-1987	US 4542741 A	24-09-1985
US 5791055	A	11-08-1998	DE 19503840 A	08-08-1996
US 5279581	A	18-01-1994	US 5108378 A AT 165981 T CA 2081064 A DE 69225456 D DE 69225456 T DK 540217 T EP 0540217 A ES 2115647 T JP 5261153 A MX 9206153 A US 5437647 A US 5356392 A US 5501672 A US 5624400 A AT 162404 T CA 2042012 A,C DE 69128742 D DE 69128742 T DK 457477 T EP 0457477 A ES 2110976 T GR 3026427 T JP 5115552 A US 5616134 A US 5312365 A	28-04-1992 15-05-1998 30-04-1993 18-06-1998 03-09-1998 25-01-1999 05-05-1993 01-07-1998 12-10-1993 01-07-1993 01-08-1995 18-10-1994 26-03-1996 29-04-1997 15-02-1998 10-11-1991 26-02-1998 30-04-1998 06-04-1998 21-11-1991 01-03-1998 30-06-1998 14-05-1993 01-04-1997 17-05-1994
WO 9735525	A	02-10-1997	US 5531754 A AU 5529496 A EP 0891155 A	02-07-1996 17-10-1997 20-01-1999
EP 0396938	A	14-11-1990	IT 1232488 B	17-02-1992

